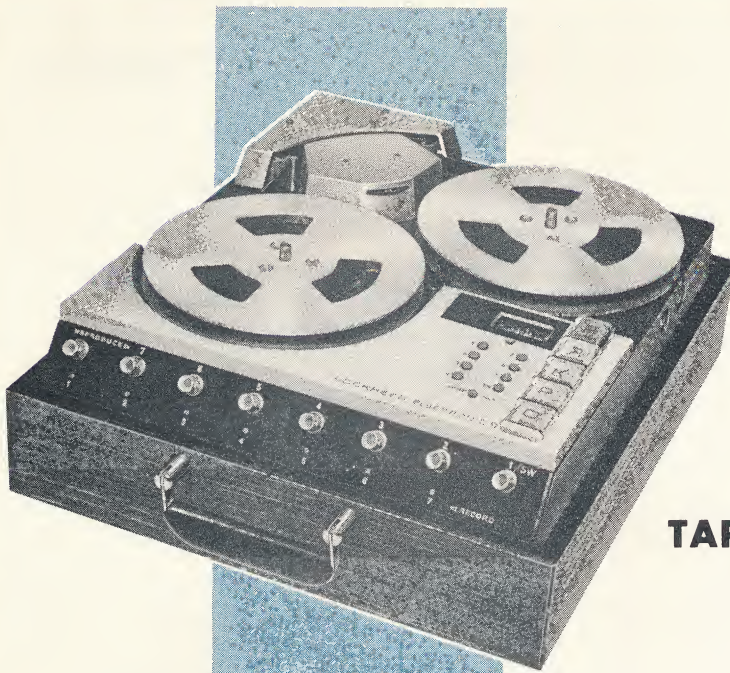




MODEL 417D

INSTRUMENTATION TAPE RECORDER/REPRODUCER

7-TRACK

PORTABLE

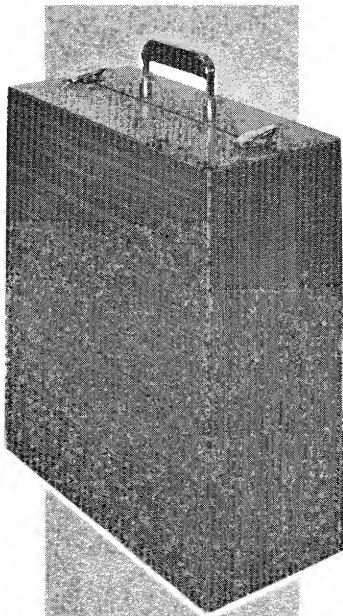
RUGGED

27 POUNDS

BATTERY-POWERED

The unique Model 417D utilizes a low-mass differential capstan drive to assure precision instrumentation recording even under difficult operating conditions.

A really portable instrumentation tape recorder/reproducer, the Model 417D provides full 7-track IRIG compatibility. Either battery or AC/DC powered, this light-weight rugged recorder makes it possible to avoid the high cost and risks of shipping equipment to test sites. Its compact, "attache case" size allows it to be carried under the seat of commercial aircraft. Recording at remote or inaccessible locations without the need for external power and attendant ground-loop problems makes the Model 417D an ideal complement to conventional rack-mounted equipment.



THE 417D PROVIDES QUALITY FEATURES HERETOFORE AVAILABLE ONLY ON THE MOST SOPHISTICATED AND COSTLY FIXED INSTALLATION RECORDERS.

**DIFFERENTIAL CAPSTAN DRIVE
PHASE-LOCK SERVO MOTOR CONTROL
DYNAMIC BRAKING**

QUALITY CONSTRUCTION

- All solid-state circuitry.
- Convenient plug-in modules.
- High efficiency "spacecraft"-type DC motors.
- Differential capstans provide constant, controlled tape-to-head contact.
- Phase-lock servo motor control to ensure accurate tape speed.
- Precision-shielded duplex pre-loaded (gyro-type) ball bearings.
- Gentle tape handling due to dynamic braking system.
- Safety interlocks to prevent accidental signal loss.
- Reel-motor control system integrated with servo for maximum efficiency.

CONSIDER THESE FEATURES

FUNCTIONAL FEATURES

- Built-in, long life, maintenance-free, rechargeable nickel-cadmium batteries.
- No external power source required.
- Operation on 28V DC or 110V AC external power with the Model 1031 Auxiliary Power Supply and Battery Charger (optional).
- Record level meter.
- Pushbutton Control.
- Rewind/Fast Forward.
- Remote Control (optional).
- Environmental Case (optional).
- Standard BNC-type connectors.
- Battery "state-of-charge" indicator.
- Voice Track (optional).
- Footage Counter (optional).
- Endless - Loop Adapter (optional).

PORTABILITY

- Total weight, only 27 lbs.
- Operates in any attitude.
- Compact "attache case" size 13- 15/16" x 15-3/16" x 6-3/8".
- Maximum power consumption only 12 watts.

PRECISION PERFORMANCE

- Flutter less than .2% RMS.
- Frequency response - 100kc direct / 10kc FM.
- 7 tracks, FM or Direct in any combination, on 1/2" tape with IRIG record or reproduce capability (4 tracks on 1/4" tape also available).
- Switchable reproduce track for field monitoring.

Specifications are subject to change without notice.

TELEPHONE (201)-757-1600 EXT. 408; TWX (201)-756-6067

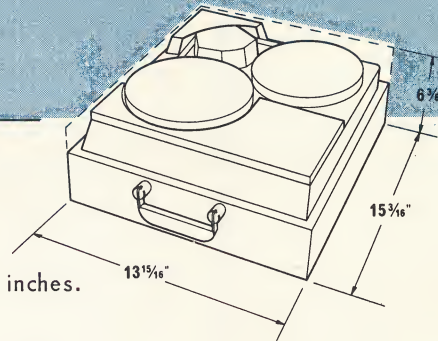
MODEL 417D INSTRUMENTATION TAPE RECORDER/REPRODUCER

LOCKHEED

SPECIFICATIONS



GENERAL CHARACTERISTICS



SIZE: 13-15/16 x 15-3/16 x 6-3/8 inches.

WEIGHT: 27 pounds.

TAPE SPEEDS: Choice of 2 speed combinations 1 7/8, 3 3/4, 7 1/2 or 7 1/2, 15, 30ips. (Speed change kit optional.)

TAPE DIMENSIONS: 1/4 - or 1/2 - inch tape. Accepts 0.75, 1.0 or 1.5 mil base tape. 7- inch diameter reels. Cover closes with reels in place.

CONTROLS: Pushbutton operation for OFF, RECORD, REPRODUCE, REWIND, FAST FORWARD. Electronic modules may be intermixed to provide any combination of Direct and FM record or reproduce channels. Recorder provides either 7-track record with switchable reproduce, or 7-track reproduce. Up to 4 tracks of simultaneous record-reproduce (7 tracks optional). Meter provided for direct-record level adjustment and battery "state-of-charge" monitoring.

START TIME: 5 seconds or less at all tape speeds from STOP to stable speed.

STOP TIME: 5 seconds or less.

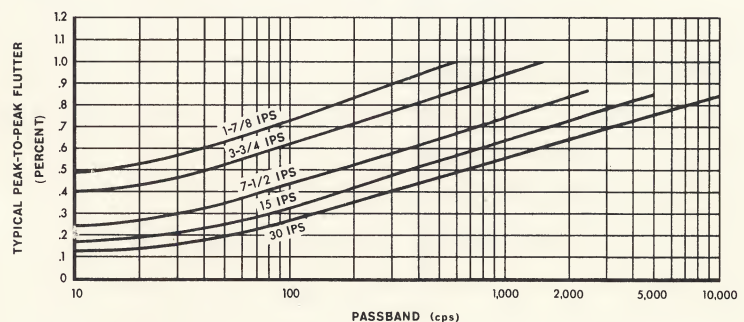
REWIND AND FORWARD TIME: 5 minutes for 1,800 feet of tape.

TAPE SPEED (ips)	3150 feet 0.65 mil	1800 feet 1.0 mil	1200 feet 1.5 mil
1-7/8	6 hours	3 hours	2 hours
3-3/4	3 hours	90 min.	1 hour
7-1/2	90 min.	45 min.	30 min.
15	45 min.	22 min.	15 min.
30	22 min.	11 min.	7 min.

INTERNAL POWER CONSUMPTION: Less than 750ma @ 17 volts, with transport and all electronics operating at 30 ips. Internal Ni-Cd battery provides 1.5 hours operation on one charge (larger battery optional). Automatic low-voltage cutoff.

BATTERY CHARGING: Charging time 14 hours at 120 ma (20 volts dc). BACPAC Battery Charger and Auxiliary Power Supply (Catalog No. 1020) available as optional equipment. Permits Recorder operation from 115/220 volts 50 to 400 cps. Also charges battery.

MAXIMUM CUMULATIVE FLUTTER:



ENVIRONMENTAL

TEMPERATURE: 32° to 120° F operating.
-20° to 160° F non-operating.

HUMIDITY: To 99% without condensation.

DIRECT RECORD/REPRODUCE SYSTEM

FREQUENCY RESPONSE:	TAPE SPEED (ips)	FREQUENCY RESPONSE (± 3 db)	SIGNAL-to-NOISE*
	30	200 to 100,000 cps	34 db
	15	100 to 50,000 cps	34 db
	7-1/2	100 to 25,000 cps	34 db
	3-3/4	100 to 12,500 cps	34 db
	1-7/8	100 to 6,250 cps	34 db

* rms signal to rms noise - 1000 cps signal recorded to 1.5% total harmonic distortion.

SIGNAL-TO-NOISE RATIO: Nominal signal level for 1.5% total harmonic distortion (1,000 cps fundamental).
Noise measurements include circuit and media noise. Measurements made with 18 db/octave attenuation bandpass filter at output of reproduce amplifier.

INPUT LEVEL: 100 mv to 10 volts rms.

OUTPUT LEVEL: 1.0 volts rms (nominal across a 10,000-ohm load at normal recording level).

INPUT IMPEDANCE: 20,000 ohms minimum.

OUTPUT IMPEDANCE: 100 ohms maximum.

HARMONIC DISTORTION: 1.5% (measured at 1,000 cps).

CROSSTALK: -42 db (below nominal signal level at 1 kc).

FM RECORD/REPRODUCE SYSTEM

SIGNAL CHARACTERISTICS:	TAPE SPEED (ips)	CENTER FREQUENCY (cps)	FREQUENCY RESPONSE ($\pm 1/2$ db)	SIGNAL-to-NOISE*
	30	54,000	0 to 10,000	40 db
	15	27,000	0 to 5000	40 db
	7-1/2	13,500	0 to 2500	40 db
	3-3/4	6,750	0 to 1250	37 db
	1-7/8	3,375	0 to 625	37 db

*rms signal to rms noise.

INPUT LEVEL: ± 1.4 volts for full deviation ($\pm 40\%$).

OUTPUT LEVEL: 1.0 volt rms.

HARMONIC DISTORTION: 1.5%

INPUT IMPEDANCE: 20,000 ohms minimum.

OUTPUT IMPEDANCE: 1,000 ohms maximum.

AC/DC LINEARITY: Better than 1% of full scale.

DRIFT: Less than 0.3% after 5 minute warm-up.

TEMPERATURE STABILITY: 0.4% per 10°F from 32° to 120°F after 5-minute warm-up.

SERVO SYSTEM

DESCRIPTION: Multiple-loop servo containing a coarse velocity-sensitive loop and a fine, high-resolution locked-phase servo. System integrated with supply and takeup reel motor control to provide overall maximum efficiency.

SPEED ACCURACY: $\pm 0.25\%$ at 70°F.

SERVO DRIFT: $\pm 1.0\%$ over operating temperature range. Special oscillator available to provide 0.1%.

MAGNETIC HEADS

NUMBER OF TRACKS:	IRIG-compatible 7-track record/reproduce.	4-track record/reproduce.
TRACK WIDTH:	0.050 inch.	0.043 inch.
TRACK SPACING:	0.070 inch center to center.	0.068 inch center to center.
GAP WIDTH:	Record head 0.0005 inch. Reproduce head 0.0001 inch. (Voice edge track optional)	Record head 0.0005 inch. Reproduce head 0.0001 inch.

Specifications are subject to change without notice.

LOCKHEED ELECTRONICS CO. INDUSTRIAL TECHNOLOGY
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